

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE



Tritium Laboratory

12 May 2016

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SWAB REPORT # 811

SWAB DATE: 3 May 2016

R/V Thomas Thompson

Dr. James D. Happell
Associate Research Professor

Distribution:
SWAB Committee
Loren Tuttle

COMMENTS TO SWAB REPORTS

12 May 2014

Typical LSC instrument background values for ^3H and ^{14}C are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in dpm/m^2 . Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m^2 . An error larger than the activity indicates that the activity is not significantly different from zero.

Criteria for SWAB Results

Category	^3H (dpm/m^2)	^{14}C (dpm m^2)	Recommendations
A	<500	<50	No action
B*	500-10,000	50-10,000	Needs cleaning before any natural tracer work. Decks in radiation vans with activities above $1000 \text{ dpm}/\text{m}^2$ should be cleaned.
C**	10,000-100,000	10,000-50,000	Must be cleaned before any use.
D***	>100,000	>50,000	May be a health hazard. Notify local radiation safety official.

Note: ^{14}C and ^{35}S have peak energies of 156 and 167 KeV, respectively; thus ^{35}S will be registered as ^{14}C by our counting techniques. Categories A, B and C are not a health hazard.

Recommended Cleaning Procedure

Wearing ordinary household rubber gloves:

^3H : Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml COUNT-OFF to 4 liters of water), using sponges to distribute solution and reabsorb it.

^{14}C : Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}\text{CO}_2$). Follow up with wash as if for ^3H .

Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D contact your institution's radiation safety office.

Note: If category C or D is encountered, we try to notify the institution promptly by phone or email.

REPORT FOR SWAB # 811

LOCATION: Newport, OR

DATE: 3 May 2016

VESSEL: R/V Thomas Thompson

TECHNICIAN: Charlene Grall

Sample #	Sample Identification	^3H dpm/m ²			^{14}C dpm/m ²		
		activity	error		activity	error	
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	-15	±	79	18	±	39
	<u>Hydro lab (Figure 1)</u>						
3	Benchtop forward of starboard sink	-68	±	115	35	±	43
4	Benchtop aft of starboard sink	-77	±	132	18	±	49
5	Aft benchtop	8	±	19	29	±	37
6	Deck in front of port aft benchtop	26	±	44	8	±	31
7	Deck in front of starboard sink	0	±	0	10	±	37
8	Deck inside lab entrance	23	±	45	7	±	31
9	Center benchtop	-24	±	58	17	±	40
10	Port aft benchtop	-31	±	74	8	±	46
11	Port forward benchtop	-50	±	120	-4	±	29
	<u>Wet Lab (Figure 2)</u>						
12	Sink area	7	±	44	2	±	32
13	Inside fume hood	-15	±	36	4	±	45
14	Center deck	19	±	47	3	±	28
	<u>Main Lab (Figure 3)</u>						
15	Deck inside aft port entrance	-5	±	27	9	±	38
16	Deck inside aft entrance	-5	±	92	16	±	37
17	Inside starboard Cospolich refrigerator	42	±	56	-11	±	34
18	Deck inside mi-port entrance	12	±	54	1	±	19
19	Deck inside forward port entrance	5	±	15	25	±	37
20	Inside -80oC freezer	33	±	44	8	±	30
21	Port sink area	14	±	34	-11	±	34
22	Starboard sink area	-12	±	28	17	±	38
23	Deck below starboard sink	-13	±	32	-7	±	30
24	Deck below port sink	-18	±	43	-4	±	18
25	Starboard deck in front of refrigerator	15	±	72	-7	±	30
26	Inside starboard GE freezer	-7	±	37	-9	±	34
27	Inside starboard GE refrigerator	13	±	41	5	±	32
28	Inside port GE freezer	-9	±	48	12	±	38
29	Inside port GE refrigerator	-19	±	45	-2	±	14

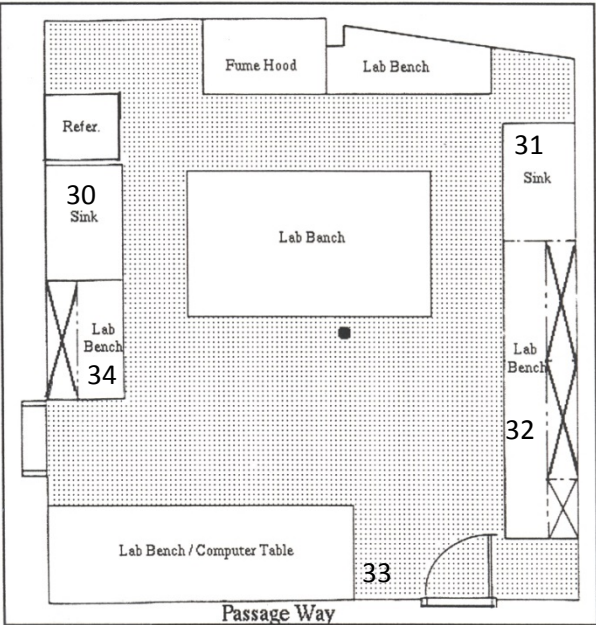
Sample #	Sample Identification	³ H dpm/m ²		¹⁴ C dpm/m ²	
		activity	error	activity	error
	<u>BioAnalytical Lab (Figure 1)</u>				
30	Aft sink area	3	± 12	16	± 37
31	Forward sink area	-88	± 149	2	± 17
32	Forward benctop	-23	± 44	3	± 63
33	Deck inside starboard entrance	8	± 189	-13	± 52
34	Intermediate bucket sample	-19	± 97	1	± 5
35	Deck inside forward scientific freezer	7	± 18	23	± 37
36	Benchtop inside aft scientific freezer	-17	± 40	-5	± 37
37	Deck in freezer vestibule area	-63	± 108	25	± 43
	<u>Computer Lab (Figure 4)</u>				
38	Deck inside forward entrance	-8	± 195	19	± 38
39	Deck inside starboard entrance	-8	± 148	22	± 38
40	Final bucket blank	-6	± 165	16	± 38

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error. The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negative values to zero. Values are only significantly above background when they are positive and larger than the error. All areas tested inside the ship were free from isotope contamination that requires cleaning.

Figure 1
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BioAnalytical Lab Layout



Hydro Lab Layout

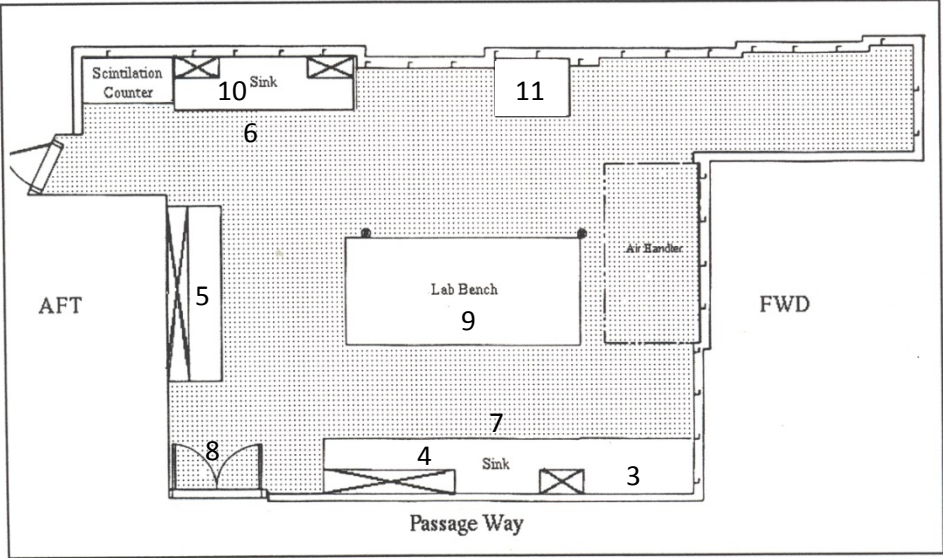
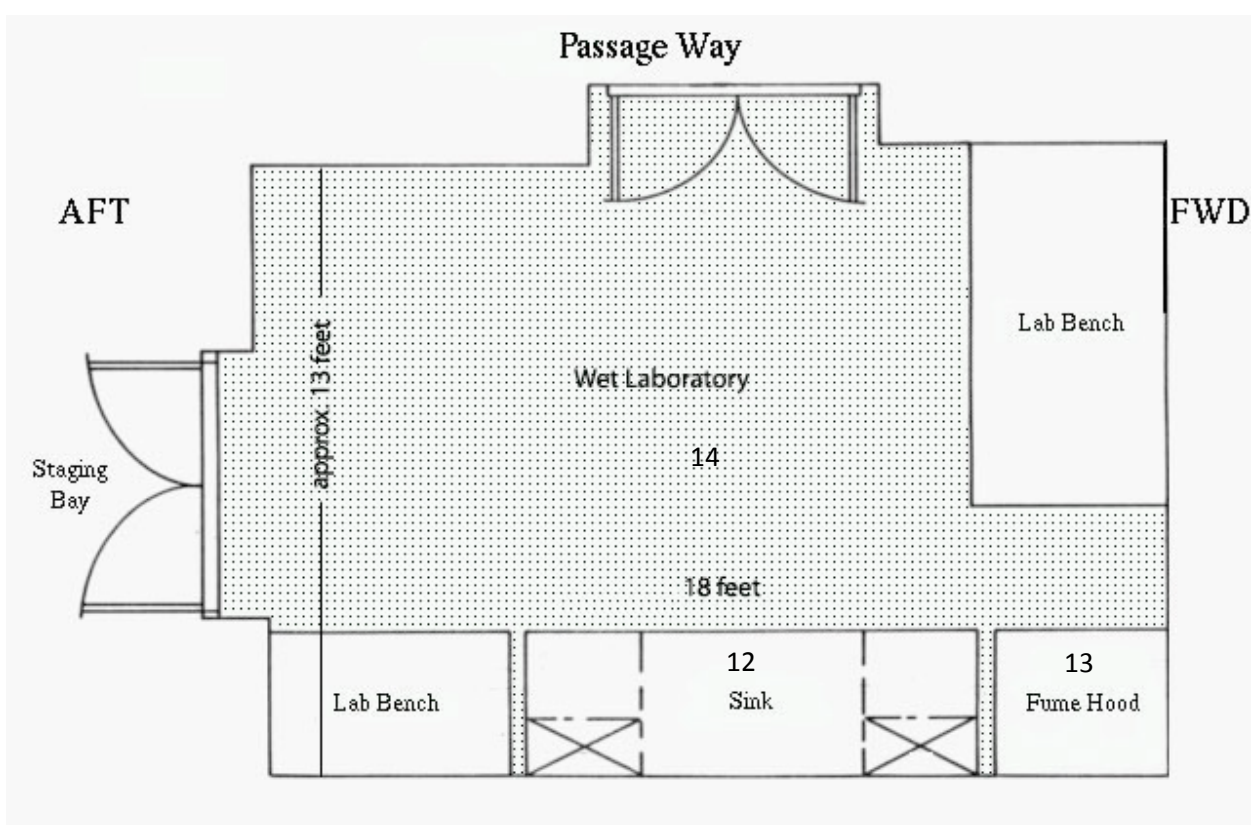


Figure 2
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Main Lab Layout

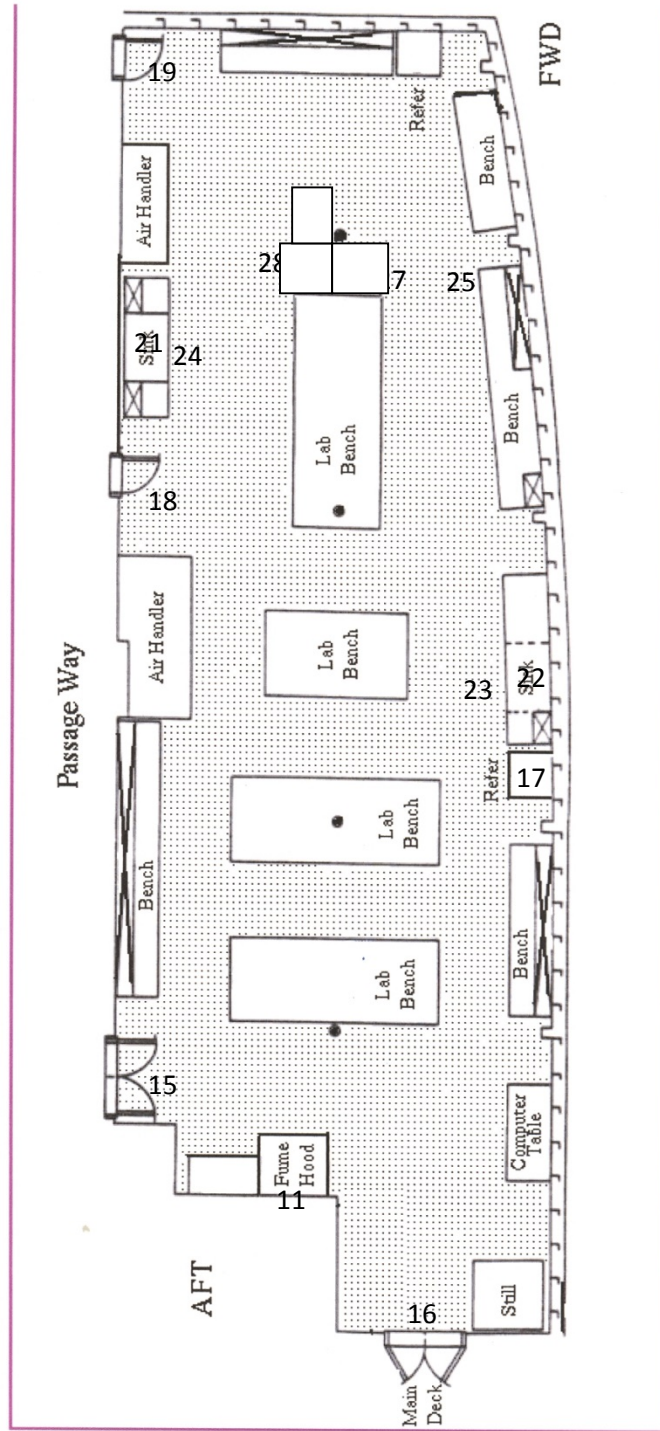


Figure 3
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Figure 4
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